



DEPARTMENT OF THE AIR FORCE  
59TH MEDICAL WING (AETC)  
JOINT BASE SAN ANTONIO - LACKLAND TEXAS



13 APR 2017

MEMORANDUM FOR SGN

ATTN: LT COL STEPHANIE D. ROWAN

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled Air National Guard Women's Sleep Study presented at/published to TSNRP Military Women's Health RIG (Research Interest Group) April meeting via Teleconference in accordance with MDWI 41-108, has been approved and assigned local file #17193.
2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.
3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist's Office, Ms. Alice Houy, office phone: 210-292-8029; email address: [alice.houy.civ@mail.mil](mailto:alice.houy.civ@mail.mil).
4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

*Linda Steel-Goodwin*

LINDA STEEL-GOODWIN, Col, USAF, BSC  
Director, Clinical Investigations & Research Support

# PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

## INSTRUCTIONS

USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

1. The author must complete page two of this form:
  - a. In Section 2, add the funding source for your study [ e.g., 59 MDW CRD Graduate Health Sciences Education (GHSE) (SGS O&M); SGS R&D; Tri-Service Nursing Research Program (TSNRP); Defense Medical Research & Development Program (DMROP); NIH; Congressionally Directed Medical Research Program (CDMRP) ; Grants; etc.]
  - b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.
2. Print your name, rank/grade, sign and date the form in the author's signature block or use an electronic signature.
3. Attach a copy of the 59 MDW IRB or IACUC approval letter for the research related study. If this is a technical publication/presentation, state the type (e.g. case report, QA/QI study, program evaluation study, informational report/briefing, etc.) in the "Protocol Title" box.
4. Attach a copy of your abstract, paper, poster and other supporting documentation.
5. Save and forward, via email, the processing form and all supporting documentation to your unit commander, program director or immediate supervisor for review/approval.
6. On page 2, have either your unit commander, program director or immediate supervisor:
  - a. Print their name, rank/grade, title; sign and date the form in the approving authority's signature block or use an electronic signature.
7. Submit your completed form and all supporting documentation to the CRD for processing (59crdpubspres@us.af.mil). This should be accomplished no later than 30 days before final clearance is required to publish/present your materials. If you have any questions or concerns, please contact the 59 CRD/Publications and Presentations Section at 292-7141 for assistance.
8. The 59 CRD/Publications and Presentations Section will route the request form to clinical investigations, 502 ISG/JAC (Ethics Review) and Public Affairs (59 MDW/PA) for review and then forward you a final letter of approval or disapproval.
9. Once your manuscript, poster or presentation has been approved for a one-time public release, you may proceed with your publication or presentation submission activities, as stated on this form. Note: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.
10. If your manuscript is accepted for scientific publication, please contact the 59 CRD/Publications and Presentations Section at 292-7141. This information is reported to the 59 MDW/DOC. All medical research or technical information publications/presentations must be reported to the Defense Technical Information Center (DTIC). See 59 MDW 41-108, *Presentation and Publication of Medical and Technical Papers*, for additional information.
11. The Joint Ethics Regulation (JER) DoD 5500.07-R, *Standards of Conduct*, provides standards of ethical conduct for all DoD personnel and their interactions with other non-DoD entities, organizations, societies, conferences, etc. Part of the Form 3039 review and approval process includes a legal ethics review to address any potential conflicts related to DoD personnel participating in non-DoD sponsored conferences, professional meetings, publication/presentation disclosures to domestic and foreign audiences, DoD personnel accepting non-DoD contributions, awards, honoraria, gifts, etc. The specific circumstances for your presentation will determine whether a legal review is necessary. If you (as the author) or your supervisor check "NO" in block 17 of the Form 3039, your research or technical documents will not be forwarded to the 502 ISG/JAC legal office for an ethics review. To assist you in making this decision about whether to request a legal review, the following examples are provided as a guideline:

For presentations before professional societies and like organizations, the 59 MDW Public Affairs Office (PAO) will provide the needed review to ensure proper disclaimers are included and the subject matter of the presentation does not create any cause for DoD concern.

If the sponsor of a conference or meeting is a DoD entity, an ethics review of your presentation is not required, since the DoD entity is responsible to obtain all approvals for the event.

If the sponsor of a conference or meeting is a non-DoD commercial entity or an entity seeking to do business with the government, then your presentation should have an ethics review.

If your travel is being paid for (in whole or in part) by a non-Federal entity (someone other than the government), a legal ethics review is needed. These requests for legal review should come through the 59 MDW Gifts and Grants Office to 502 ISG/JAC.

If you are receiving an honorarium or payment for speaking, a legal ethics review is required.

If you (as the author) or your supervisor check "YES" in block 17 of the Form 3039, your research or technical documents will be forwarded simultaneously to the 502 ISG/JAC legal office and PAO for review to help reduce turn-around time. If you have any questions regarding legal reviews, please contact the legal office at (210) 671-5795/3365, DSN 473.

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:

*"The views expressed are those of the {author(s)} {presenter(s)} and do not reflect the official views or policy of the Department of Defense or its Components"*

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving humans:

*"The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02\_AFI 40-402"*

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving animals, as required by AFMAN 40-401\_IP :

*"The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."*



# PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

1. TO: CLINICAL RESEARCH	2. FROM: (Author's Name, Rank, Grade, Office Symbol) Stephanie D. Rowan, Lt Col, 05, SGN/149MDG	3. GME/GRSE STUDENT: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	4. PROTOCOL NUMBER: FSG20160012H
5. PROTOCOL TITLE: (NOTE: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.) "Effects of Sleep Deficiency on National Guard Personnel Responding to Disasters."			
6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED: "Air National Guard Women's Sleep Health Study"			
7. FUNDING RECEIVED FOR THIS STUDY? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO FUNDING SOURCE: Tri-Service Nursing Research Program (TSNRP)			
8. DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
9. IS THIS MATERIAL CLASSIFIED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
10. IS THIS MATERIAL SUBJECT TO ANY LEGAL RESTRICTIONS FOR PUBLICATION OR PRESENTATION THROUGH A COLLABORATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA), MATERIAL TRANSFER AGREEMENT (MTA), INTELLECTUAL PROPERTY RIGHTS AGREEMENT ETC.? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO NOTE: If the answer is YES then attach a copy of the Agreement to the Publications/Presentations Request Form.			
11. MATERIAL IS FOR: <input checked="" type="checkbox"/> DOMESTIC RELEASE <input type="checkbox"/> FOREIGN RELEASE CHECK APPROPRIATE BOX OR BOXES FOR APPROVAL WITH THIS REQUEST. ATTACH COPY OF MATERIAL TO BE PUBLISHED/PRESENTED.			
<input type="checkbox"/> 11a. PUBLICATION/JOURNAL (List intended publication/journal.)			
<input type="checkbox"/> 11b. PUBLISHED ABSTRACT (List intended journal.)			
<input type="checkbox"/> 11c. POSTER (To be demonstrated at meeting: name of meeting, city, state, and date of meeting.)			
<input type="checkbox"/> 11d. PLATFORM PRESENTATION (At civilian institutions: name of meeting, state, and date of meeting.)			
<input checked="" type="checkbox"/> 11e. OTHER (Describe: name of meeting, city, state, and date of meeting.) Slides presented at the TSNRP Military Women's Health RIG (Research Interest Group) April meeting via Teleconference			
12. HAVE YOUR ATTACHED RESEARCH/TECHNICAL MATERIALS BEEN PREVIOUSLY APPROVED TO BE PUBLISHED/PRESENTED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO ASSIGNED FILE # _____ DATE _____			
13. EXPECTED DATE WHEN YOU WILL NEED THE CRD TO SUBMIT YOUR CLEARED PRESENTATION/PUBLICATION TO DTIC NOTE: All publications/presentations are required to be placed in the Defense Technical Information Center (DTIC).			
DATE April 7, 2017			
14. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email) Morgan, Brenda brenda.morgan@us.af.mil			15. DUTY PHONE/PAGER NUMBER 210-292-5931
16. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.			
LAST NAME, FIRST NAME AND M.I.	GRADE/RANK	SQUADRON/GROUP/OFFICE SYMBOL	INSTITUTION (If not 59 MDW)
a. Primary/Corresponding Author Denise, Smart, RN, MSN	Lt Col (ret)	n/a	Washington State University
b. Stephanie Rowan, RN, MSN	Lt Col	149th MDG/SGN/JBSA-Kelly Field	UTHSCSA
c. Amanda Roby, PhD	Capt	141 MDG	Fairchild AFB
d. Lois James, PhD, MA, BA	n/a	n/a	Washington State University
e. Tamara Odom-Maryon, PhD, MS, BS	n/a	n/a	Washington State University
17. IS A 502 ISG/JAC ETHICS REVIEW REQUIRED (JER DOD 5500.07-R)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
I CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401 JP, AND 59 MDW 41-108. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.			
18. AUTHOR'S PRINTED NAME, RANK, GRADE Stephanie D. Rowan, Lt Col, 05		19. AUTHOR'S SIGNATURE STEPHANIE D. ROWAN 05LT00L Digitally signed by STEPHANIE D. ROWAN 05LT00L Date: 2017.04.10 10:00:00 -0500	20. DATE March 24, 2017
21. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE Kevin Steel, Lt Col, USAF, MC		22. APPROVING AUTHORITY'S SIGNATURE STEEL KEVIN E 1162268558 Digitally signed by STEEL KEVIN E 1162268558 Date: 2017.03.28 14:00:00 -0500	23. DATE March 28, 2017

# PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

## 1st ENDORSEMENT (59 MDW/8GVU Use Only)

TO: Clinical Research Division 59 MDW/CRD Contact 292-7141 for email instructions.	24. DATE RECEIVED March 30, 2017	25. ASSIGNED PROCESSING REQUEST FILE NUMBER 17193
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26. DATE REVIEWED April 10, 2017	27. DATE FORWARDED TO 502 ISG/JAC
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28. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES: ☒ NO ☐ YES If yes, give date. ☐ N/A

29. COMMENTS ☒ APPROVED ☐ DISAPPROVED  
Presentation of IRB approved research with appropriate disclaimers. Approved

30. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Kevin Kupferer/GS13/Human Research Subject Protection Expert	31. REVIEWER SIGNATURE KUPFERER KEVIN R. 1056657270	32. DATE April 10, 2017
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## 2nd ENDORSEMENT (502 ISG/JAC Use Only)

33. DATE RECEIVED	34. DATE FORWARDED TO 59 MDW/PA
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35. COMMENTS ☐ APPROVED (In compliance with security and policy review directives.) ☐ DISAPPROVED

36. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	37. REVIEWER SIGNATURE	38. DATE
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## 3rd ENDORSEMENT (59 MDW/PA Use Only)

39. DATE RECEIVED April 11, 2017	40. DATE FORWARDED TO 59 MDW/8GVU April 13, 2017
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41. COMMENTS ☒ APPROVED (In compliance with security and policy review directives.) ☐ DISAPPROVED

42. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Kevin Inuma, SSgt/E-5, 59 MDW Public Affairs	43. REVIEWER SIGNATURE INUMA KEVIN MITSUGU 1296227	44. DATE April 13, 2017
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## 4th ENDORSEMENT (59 MDW/8GVU Use Only)

45. DATE RECEIVED	46. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> COULD NOT BE REACHED <input type="checkbox"/> LEFT MESSAGE
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47. COMMENTS ☐ APPROVED ☐ DISAPPROVED

48. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	49. REVIEWER SIGNATURE	50. DATE
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Air National Guard Women's Sleep Health Study  
WASHINGTON STATE UNIVERSITY COLLEGE OF NURSING



## TRISERVICE NURSING RESEARCH PROGRAM

*Fostering Excellence in Military Nursing Science*

**This research is funded by the Tri-Service Nursing Research Program**



Disclaimer: *The views expressed are those of the presents and do not reflect the official views or policy of the Department of Defense. The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02\_AFI 40-402.*



# Research Project Key Personnel

## Washington State University



College of  
**Nursing**  
WASHINGTON STATE UNIVERSITY

Dr. Denise Smart, DrPH, MPH, BSN (Retired Lt. Col.)

Dr. Lois James, PhD, MA, BA

Dr. Tamara Odom-Maryon, PhD, MS, BS

## U.S. Air National Guard



LT. Col. Stephane Rowan – 149 Medical Group, JBSA-Kelly Field AFB, TX

Capt. Amanda Roby – 141 Medical Group, Fairchild AFB, WA



College of Nursing

# Background

- Preliminary data presented in this presentation represents an on-going larger two-year study.
- Data collection will not be completed until June 2017.
- For the purposes of this presentation, female **descriptive** data will be compared to male data from the same medical group.



# Introduction

- Sleep is an essential part of life and considered a component of the Performance Triad (Lentino, Purvis, Murphy & Deuster, 2013).
- Quality sleep (number of hours and adequacy of those hours) can be considered part of overall health and well-being.
- Sleep disruptions have been linked to numerous health risks .
- Three general domains have been documented in the literature:
  - Metabolism & obesity
  - Psychological health
  - Neurobehavioral performance
- Specific careers or occupations are known to have an impact on sleep quality and quantity:
  - Pilots, nurses, other medical professionals, truck drivers, and military
  - Basically, any occupation that requires 24/7 coverage or responsiveness to duty
  - Shift work (Boivin & Boudreau, 2014)
- In addition, military female populations may have pregnancy, childbirth, and newborn/child care responsibilities that can interfere with sleep or contribute to sleep deficiencies.

# Problem Statement

- National Guard personnel have the additional responsibility of **military commitments** (part-time or full-time), **civilian employment**, and family or personal life (fitness, leisure time, hobbies, volunteer work, school, etc.)
- Medical professionals may work various shifts and not have the ability to “acclimate” prior to reporting for military UTA or “Drill weekends”.
- ANG medical personnel who are assigned to and train for disaster response (CERF-P/HRF) may be called up in real-world disasters or training without the ability to transition from night shift work to military day time or extended hours work.
- The nature of the CERF-P/Homeland Response Force training means exposure to natural elements (heat/cold environments, chemicals, rain/snow) which can contribute to fatigue.



# Overall Study Objectives

- To determine the prevalence and impact of sleep loss on Air National Guard medical personnel responding to a major disaster
- To monitor National Guard members' sleep and operational performance during a high-intensity disaster training exercise.

# Methodology / Study Design

- **Cross-sectional study**
  - *Repeated measures*
- **Convenience sample**
- **Baseline data (7-30 days)**
  - *Examining civilian sleep/wake cycles*
- **Pre-exercise data (3 days)**
  - *Transitioning between civilian life and military obligations*
- **Training Exercise data (3-4 days) & EXEVAL (7-8 days)**



# Measurement Strategies

- ❖ Demographic questions ( 16 items)
- ❖ RAND Survey (29 items): PSQI, PSQI Bedpartner, Berlin Questionnaire, Insomnia Severity Index
- ❖ Readiband (Actigraphy)
  - ❖ Sleep Quantity-amount of sleep per day; how long it takes to fall asleep, number of wake times
  - ❖ Sleep Effectiveness-a measurement of mental fatigue or accident risk
  - ❖ Sleep Efficiency- a measure of sleep quality
- ❖ Sleep Diary (AM & PM reports)
  - ❖ Sleep Satisfaction
- ❖ Karolinska Sleepiness Scale – Sleepiness (1 question 4 times day during training exercise)
- ❖ Cognitive Skills Assessments: BLS & Medication Calculation questions(1 question 4 times day during training exercise)

# Data Collection

Air National Guard Base 1	South Central U.S. Region	Air National Guard Base 2	Pacific U.S. Region
Summer 2016**	Baseline – 7 Days Demographic; Rand Sleep Survey; Actigraphy; sleep diary	Spring 2017	Baseline – 7 Days Demographic; RAND Sleep Survey; Actigraphy; Sleep diary
30 days from baseline	Pre Exercise – 3 Days Actigraphy; Sleep diary		
	Exercise – 3 Days Critical skills; Actigraphy; sleep diary; heat injury; KSS		Exercise – 3 Days Actigraphy; Sleep diary; Critical skills; KSS
Winter 2017	Exercise – 3 Days Demographic; Rand Sleep Survey; Actigraphy; sleep diary; Critical skills; KSS	Summer 2017	Pre Exercise – 2-3 Days Actigraphy; Sleep diary; Critical skills; KSS
Spring 2017	Post Exercise – 4-5 Days Actigraphy; Sleep diary		
	Exercise – 7 Days Demographic; Rand Sleep Survey; Actigraphy; sleep diary; Critical skills; KSS		EXEVAL – 4-5 Days Actigraphy; Sleep diary; Critical skills; KSS
	(EXEVAL)		



## Sample Size

Site 1: N=12/37 (39%) Female

Site 2: N=14/34 (41%) Female

# RESULTS - DEMOGRAPHICS

Demographic Summary of Air National Guard Medical Participants				
GENDER	Female	Count (%)	Male	Count (%)
		12 (38.7%)		19 (61.3%)
AGE	Mean	35 years	Mean	36 years
	Range	23-57 y/o	Range	21-47 y/o
EDUCATION	Some college but no degree	2 (16.7%)	Some college but no degree	4 (21.1%)
	Associated / Vocational Deg.	2 (16.7%)	Associated / Vocational Deg.	3 (15.8%)
	Bachelors	6 (50%)	Bachelors	5 (26.3%)
	Masters	0	Masters	6 (31.6%)
	Doctoral	1 (8.3%)	Doctoral	0
			Other	1 (5.3%)
RANK	Enlisted	8 (66.7%)	Enlisted	13 (68.4%)
	Officer	4 (33.3%)	Officer	6 (31.6%)
MARTIAL STATUS	Single	1 (8.3%)	Single	7 (36.8%)
	Married	7 (58.3%)	Married	10 (52.6%)
	Living with a Partner	3 (25.0%)	Living with a Partner	0
	Divorced	1 (8.3%)	Divorced	2 (10.5%)
EMPLOYMENT STATUS	Full Time	10 (83.3%)	Full Time	17 (89.5%)
	Part Time	1 (8.3%)	Part Time	1 (5.3%)
	Part time + Student	1 (8.3%)	Part time + Student	1 (5.3%)
DEPLOYMENTS	Total Personnel	5 (41.7%)	Total Personnel	10 (52.6%)
	Total Deployments	18	Total Deployments	23
DEPLOYMENT DURATION	3 Month or Less	0	3 Month or Less	3
	3-6 months	4	3-6 months	4
	6-9 months	1	6-9 months	3
	>9 Months	0	>9 Months	0
COMBAT EXPOSURE		1		7

## INFO – RAND SURVEY

The RAND Sleep Health Survey - Comprised of 30 questions from the following areas:

1. The Pittsburgh Sleep Quality Index (PSQI)-20 items
2. The PSQI Bedpartner Item (6 items)
3. The Berlin Questionnaire (Fatigue)-1 item
4. Insomnia Severity Index- 1 item
5. Sleep-related behaviors- 3 items
6. Shift work-usual work pattern



# RESULTS – Pittsburgh Sleep Quality Index

Pittsburgh Sleep Quality Index (PSQI) - JULY				
	BED TIME (RANGE)	MINS FALL ASLEEP (AVE.)	AWAKE TIME (RANGE)	HOURS OF SLEEP (AVE.)
JULY 2016	21:30 - 23:30	15	4:30 - 9:30	6.73
	Not during the Past month	Less than once a week	Once or twice a week	Three or more times a week
CANNOT FALL ASLEEP WITHIN 30 MINS	54.55%	9.09%	36.36%	0.00%
WAKE UP IN THE MIDDLE OF THE NIGHT	18.18%	18.18%	27.27%	36.36%
GET UP TO USE BATHROOM	36.36%	27.27%	18.18%	18.18%
CANNOT BREATHE COMFORTABLY	90.91%	9.09%	0.00%	0.00%
COUGH OR SNORE	81.82%	9.09%	0.00%	9.09%
FEEL COLD	63.64%	9.09%	18.18%	9.09%
FEEL HOT	45.45%	18.18%	27.27%	9.09%
BAD DREAMS	63.64%	18.18%	9.09%	9.09%
PAIN	72.73%	27.27%	0.00%	0.00%
MEDICINES TO HELP SLEEP	90.91%	9.09%	0.00%	0.00%
TROUBLE STAY AWAKE WHEN DRIVING	54.55%	36.36%	9.09%	0.00%
SLEEP QUALITY	Very Good	Fairly Good	Fairly Bad	Very Bad
	9.09%	72.73%	18.18%	0.00%
KEEP UP ENTHUSIASM	Not a problem at all	Only a slight problem	Somewhat a problem	Big problem
	54.55%	18.18%	18.18%	9.09%
BEDPARTNER HAD...	Not during the Past month	Less than once a week	Once or twice a week	Three or more times a week
LOUD SNORING	36.36%	18.18%	18.18%	27.27%
LONG PAUSES BETWEEN BREATHS	72.73%	9.09%	9.09%	9.09%
LEGS TWITCHING	63.64%	0.00%	18.18%	18.18%
DISORIENTATION	100.00%	0.00%	0.00%	0.00%

# RESULTS – Pittsburgh Sleep Quality Index

Pittsburgh Sleep Quality Index (PSQI)				
	BED TIME (RANGE)	MINS FALL ASLEEP (AVE.)	AWAKE TIME (RANGE)	HOURS OF SLEEP (AVE.)
AUG 2016	21:00 - 0:00	23	4:15 - 10:00	6.90
	Not during the Past month	Less than once a week	Once or twice a week	Three or more times a week
CANNOT FALL ASLEEP WITHIN 30 MINS	40.0%	20.0%	20.0%	20.0%
WAKE UP IN THE MIDDLE OF THE NIGHT	40.0%	10.0%	10.0%	40.0%
GET UP TO USE BATHROOM	50.0%	20.0%	10.0%	10.0%
CANNOT BREATHE COMFORTABLY	100.0%	0%	0%	0%
COUGH OR SNORE	80.0%	0%	20.0%	0%
FEEL COLD	60.0%	20.0%	20.0%	0%
FEEL HOT	40.0%	10.0%	40.0%	10.0%
BAD DREAMS	80.0%	10.0%	10.0%	0%
PAIN	90.0%	0%	10.0%	0%
MEDICATION to HELP SLEEP	70.0%	10.0%	10.0%	10.0%
TROUBLE STAY AWAKE WHEN DRIVING	90.0%	10.0%	0%	0%
SLEEP QUALITY	Very Good	Fairly Good	Fairly Bad	Very Bad
	40.0%	40.0%	20.0%	0%
KEEP UP ENTHUSIASM	Not a problem at all	Only a slight problem	Somewhat a problem	Big problem
	50.0%	10.0%	30.0%	10.0%
BEDPARTNER HAD...	Not during the Past month	Less than once a week	Once or twice a week	Three or more times a week
LOUD SNORING	30.0%	30.0%	20.0%	20.0%
LONG PAUSES BETWEEN BREATHS	70.0%	10.0%	10.0%	10.0%
LEGS TWITCHING	50.0%	20.0%	0%	30.0%
DISORIENTATION	100.0%	0%	0%	0%

# RESULTS – BERLIN, INSOMNIA, SLEEP RELATED

BERLIN QUESTIONNAIRE - JULY					
FEEL TIRED, FATIGUED	NEARLY DAILY	3-4 TIMES A WEEK	1-2 TIMES A WEEK	1-2 TIMES A MONTH	NEVER
	9.09%	27.27%	18.18%	18.18%	27.27%
INSOMNIA SEVERITY INDEX - JULY					
INTERFERE WITH WORK	NOT AT ALL	A LITTLE	SOMEWHAT	MUCH	VERY MUCH
	36.36%	36.36%	18.18%	0%	9.09%
SLEEP-RELATED BEHAVIORS - JULY					
GET OUT BED AT DIFFERENT TIME	ALWAYS	FREQUENTLY	SOMETIMES	RARELY	NEVER
	0%	18.18%	36.36%	36.36%	9.09%
THINGS TO HELP STAY AWAKE	Not during the Past month	Less than once a week	Once or twice a week	Three or more times a week	Daily
	27.27%	0%	36.36%	9.09%	27.27%
BOTHERED BY DREAMS		Not at all	A little bit	Moderately to Extremely	
		100.0%			
WORK PATTERN	Day Time	Shifts with nights	Shifts without nights	Permanent nights	Other
	72.73%	9.09%	9.09%	0%	9.09%



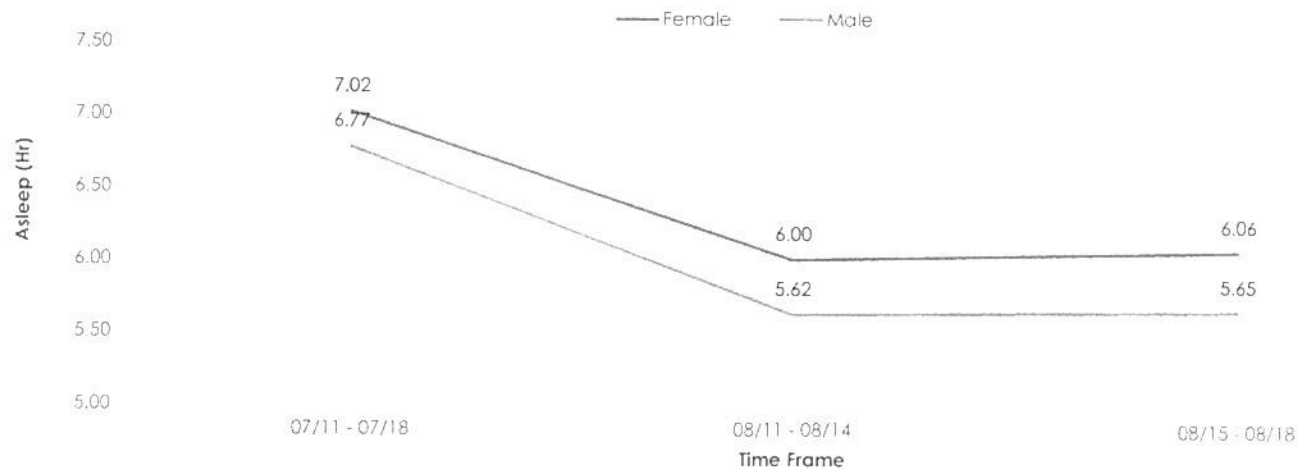
# RESULTS – BERLIN, INSOMNIA, SLEEP RELATED

BERLIN QUESTIONNAIRE - AUGUST					
FEEL TIRED, FATIGUED	NEARLY DAILY	3-4 TIMES A WEEK	1-2 TIMES A WEEK	1-2 TIMES A MONTH	NEVER
	20.0%	10.0%	10.0%	40.0%	20.0%
INSOMNIA SEVERITY INDEX - AUGUST					
INTERFERE WITH WORK	NOT AT ALL	A LITTLE	SOMEWHAT	MUCH	VERY MUCH
	50.0%	40.0%	10.0%	0%	0%
SLEEP-RELATED BEHAVIORS - AUGUST					
GET OUT BED AT DIFFERENT TIME	ALWAYS	FREQUENTLY	SOMETIMES	RARELY	NEVER
	10.0%	30.0%	20.0%	20.0%	20.0%
THINGS TO HELP STAY AWAKE	Not during the Past month	Less than once a week	Once or twice a week	Three or more times a week	Daily
	20.0%	20.0%	20.0%	10.00%	30.00%
BOTHERED BY DREAMS		Not at all	A little bit	Moderately to Extremely	
		70.0%	30.0%		
WORK PATTERN	Day Time	Shifts with nights	Shifts without nights	Permanent nights	Other
	80.0%	0.0%	10.0%	0%	10.0%

# RESULTS – SLEEP QUANTITY

Name \ Time Frame	07/11 - 07/18	08/11 - 08/14	08/15 - 08/18
<b>Female</b>	<b>Asleep (Hr)</b>	<b>Asleep (Hr)</b>	<b>Asleep (Hr)</b>
<b>AVERAGE</b>	7.02	6.00	6.06
<b>RANGE</b>	6.34 - 8.21	4.83 - 7.40	5.19 - 7.31
<b>Male</b>	<b>Asleep (Hr)</b>	<b>Asleep (Hr)</b>	<b>Asleep (Hr)</b>
<b>AVERAGE</b>	6.77	5.62	5.65
<b>RANGE</b>	5.56 - 8.03	4.08 - 7.02	4.65 - 6.96

FEMALE VS. MALE ASLSEEP HOURS IN TIME FRAME



# RESULTS – SLEEP QUANTITY

\*Missing Data table and Graph

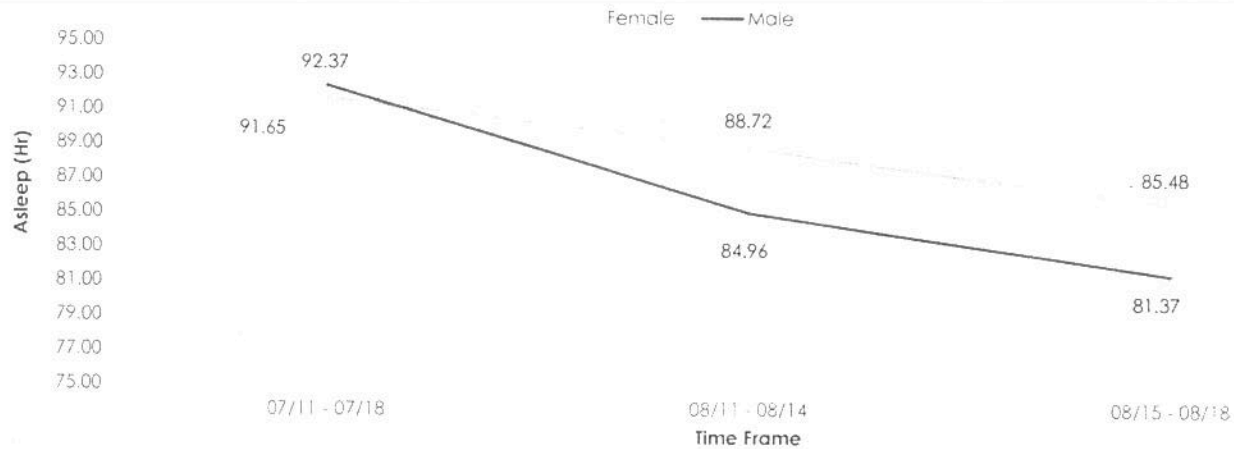
Name	Time Frame	07/11 - 07/18	08/11 - 08/14	08/15 - 08/18
Mixed		Asleep (Hr)	Asleep (Hr)	Asleep (Hr)
M		6.67		
M			5.39	5.19
M		7.62		7.06
F		6.59		
F				
M			6.83	5.81
F			6.73	6.71



# RESULTS – SLEEP EFFECTIVNESS

Female	Average effectiveness	Average effectiveness	Average effectiveness
AVERAGE	91.65	88.72	85.48
RANGE	84.80-96.54	80.00-95.65	76.50-94.25
Male	Average effectiveness	Average effectiveness	Average effectiveness
AVERAGE	92.37	84.96*	81.37*
RANGE	89.40-96.90	81.15-94.68	76.90-89.23

FEMALE VS. MALE SLEEP EFFECTIVENESS IN TIME FRAME



# RESULTS – SLEEP EFFECTIVNESS

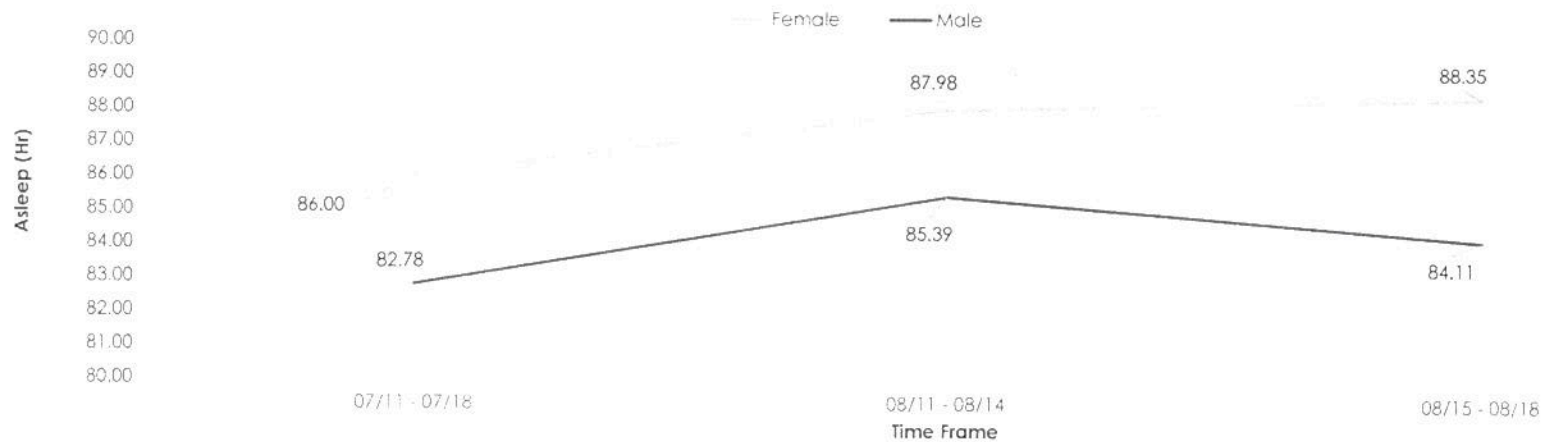
\*Missing Data table and Graph

Name	Time Frame	07/11 - 07/18	08/11 - 08/14	08/15 - 08/18
Mixed		Average effectiveness	Average effectiveness	Average effectiveness
M		90.90		
M			93.03	79.60
M		95.08		91.57
F		93.26		
M			82.70	82.13
M			94.88	88.38
F			92.55	90.40

# RESULTS – SLEEP EFFICIENCY

Time Frame	07/11 - 07/18	08/11 - 08/14	08/15 - 08/18
Female	Average efficiency	Average efficiency	Average efficiency
AVERAGE	86.00	87.98	88.35
RANGE	80.98 - 90.10	81.50 - 93.75	79.28 - 94.38
Male	Average efficiency	Average efficiency	Average efficiency
AVERAGE	82.78*	85.39*	84.11*
RANGE	74.98 - 88.68	74.93 - 93.90	75.40 - 89.93

FEMALE VS. MALE SLEEP EFFICIENCY IN TIME FRAME





# RESULTS – SLEEP EFFICIENCY \*Missing Data table and Graph

Name	Time Frame	07/11 - 07/18	08/11 - 08/14	08/15 - 08/18
Mixed		Average efficiency	Average efficiency	Average efficiency
M		83.80		
M			75.30	68.43
M		84.70		93.90
F		87.18		
F				
M			85.23	87.65
F			86.00	94.00

# RESULTS – SLEEP DIARY (SATISFACTION SURVEY)

## SLEEP AM DATA SUMMARY (FEMALE)

Total Self Report	BaseLine (July 11-18)	Pre Exercise (Aug 11-14)	Exercise (Aug 15-18)
	43	25	24
Wide Awake	16 (37.2%)	5 (20%)	3 (12.5%)
Awake but a little tired	13 (30.2%)	7 (28%)	13 (54.2%)
Sleepy	14 (32.6%)	13 (52%)	8 (33.3%)

## SLEEP PM DATA SUMMARY (FEMALE)

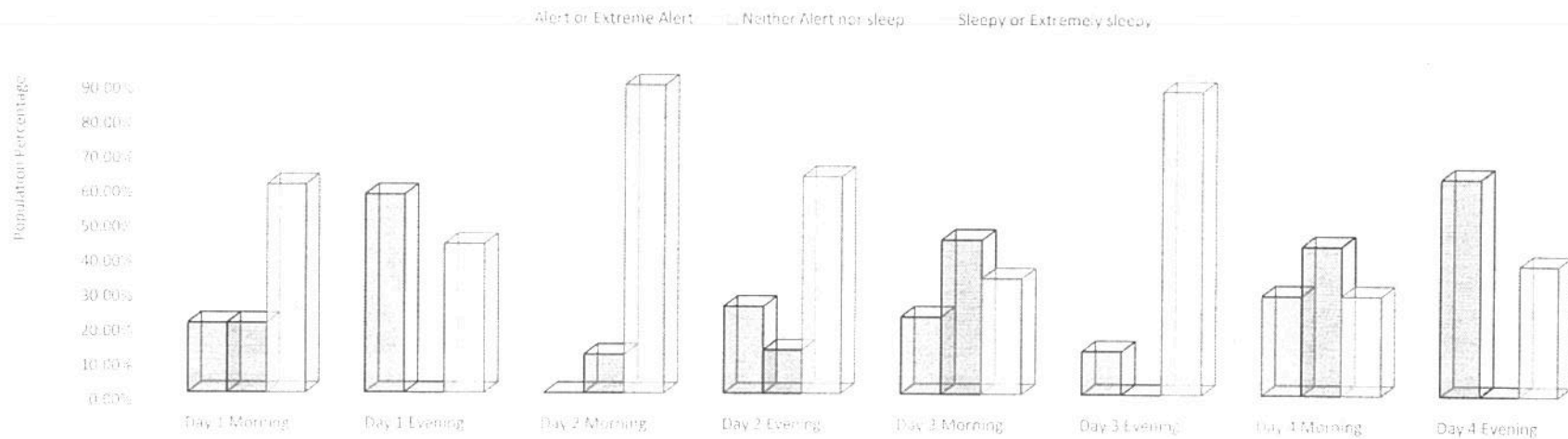
Total Self Report	BaseLine (July 11-18)	Pre Exercise (Aug 11-14)	Exercise (Aug 15-18)
	49	29	19
Very Sleepy	5 (10.2%)	2 (6.9%)	3 (15.8%)
Somewhat Tired	18 (36.7%)	10 (34.5%)	11 (57.9%)
Fairly Alert	17 (34.7%)	12 (41.4%)	4 (21.1%)
Widely Awake	9 (18.4%)	5 (17.2%)	1 (5.3%)

# RESULTS – KSS (SLEEPINESS)

## Data collapsed into 3 categories

Category/Timeline (Female)	1.1	1.4	2.1	2.4	3.1	3.4	4.1	4.4
Total Population	12	12	12	12	12	12	12	12
Total Response	10 (83.3%)	7 (58.3%)	9 (75%)	8 (66.7%)	9 (75%)	8 (66.7%)	7 (58.3%)	8 (66.7%)
Alert or Extreme Alert	2 (20.0%)	4 (57.1%)	0 (0%)	2 (25.0%)	2 (22.2%)	1 (12.5%)	2 (28.6%)	5 (62.5%)
Neither Alert nor sleep	2 (20.0%)	0 (0%)	1 (11.1%)	1 (12.5%)	4 (44.4%)	0 (0%)	3 (42.9%)	0 (0%)
Sleepy or Extremely sleepy**	6 (60.0%)	3 (42.9%)	8 (88.9%)	5 (62.5%)	3 (33.3%)	7 (87.5%)	2 (28.6%)	3 (37.5%)

### FEMALE SLEEPINESS VS. TIME FRAME





## DISCUSSION

- This presentation is only a descriptive preview of one data collection period. *P* values were not calculated as the sample size is small and the data were not powered around the smaller sample size.
- We are reporting that based on 1 data collection period, our preliminary data appears to support our hypothesis that during challenging field exercises that require long hours, under hot conditions (temperatures ranged 90-100+ degrees F & hours of training could extend to 14-18 hours per day) that sleep quantity, quality and efficiency do trend downward.
- Military females tended to sleep longer and have higher effectiveness & efficiency scores overall at all 3 time periods reported compared to their male counterparts.

## Unique Challenges of Research with National Guard

- IRB & HRPO
- Burden of wearing Readibands (Actigraphy sleep recording device)
- Burden of returning or retrieving equipment
- Equipment failure
- Compliance with wearing Readibands
- Access to Smart phones for receiving survey questions multiple times/day
- Nature of CERF-P/HRF Disaster training
- Safety issues with wearing Readibands and performing tasks
- PAO review of dissemination

# CONCLUSION

## Lessons learned:

- Consider participant burden- wearing the Readibands for 40 days to accommodate when researchers had physical contact with participants to activate the actigraphy bands and collect them resulted in a number of Readibands without data due to either band failure, low batteries, or inconsistent wearing of the band.
- Developing electronic survey methods requires participants have Smart phones and text messaging (SMS) capability, and access to their phones 4 times a day during the field training.
- We acknowledged, that for safety and command purposes, this would result in missing data. We planned for any participant who did not have a Smart phone and purchased 2 replacement phones with sufficient phone minutes to accommodate the study period, but did not need them.
- Coordinating travel with UTA and AT training days requires research team flexibility, a site coordinator, and logistical planning 2-3 months in advance with Plan B if military changes their original plans.

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# CONTACT

Name: Dr. Lois James-Sleep  
researcher

Email: [lois.james@wsu.edu](mailto:lois.james@wsu.edu)

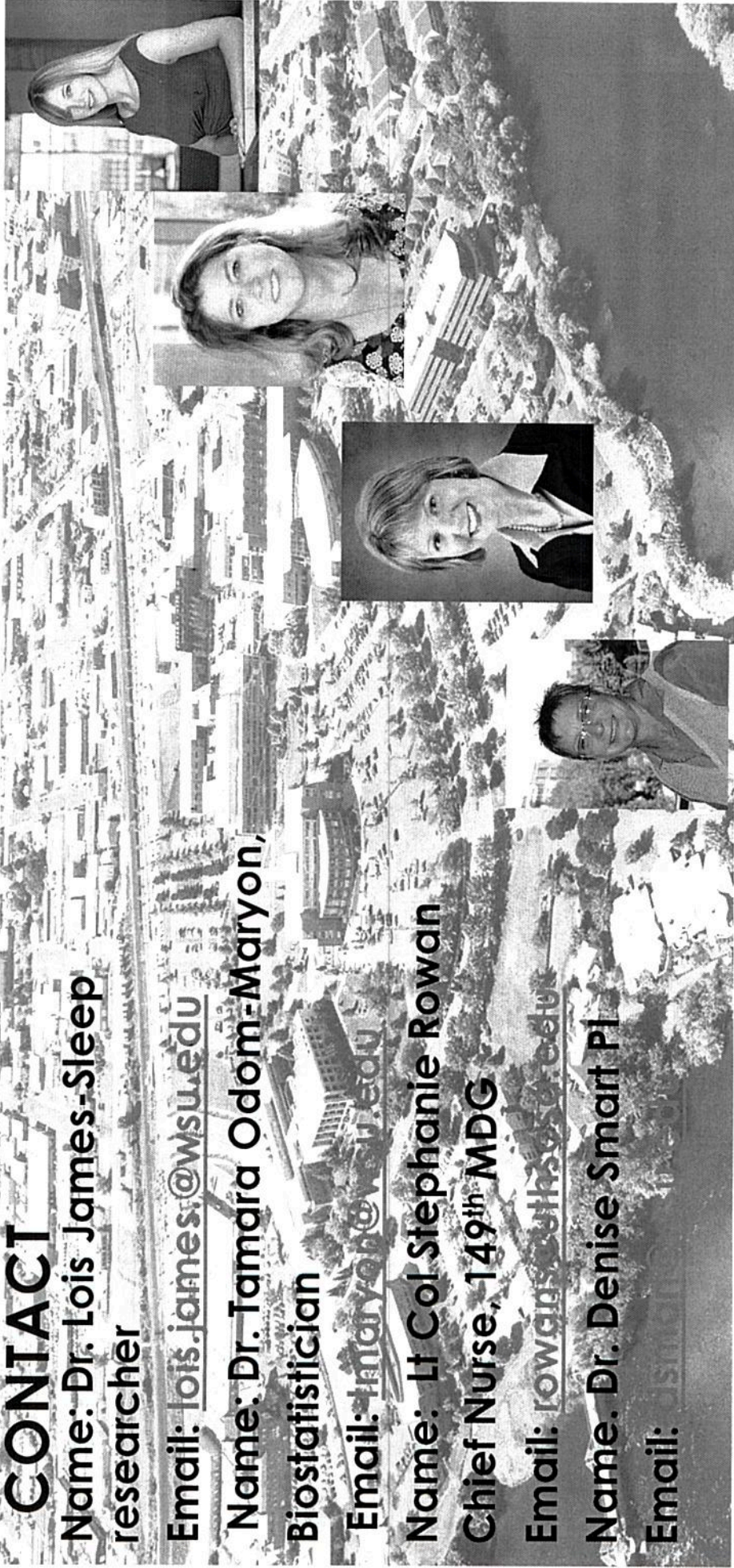
Name: Dr. Tamara Odom-Maryon,  
Biostatistician

Email: [tmaryon@wsu.edu](mailto:tmaryon@wsu.edu)

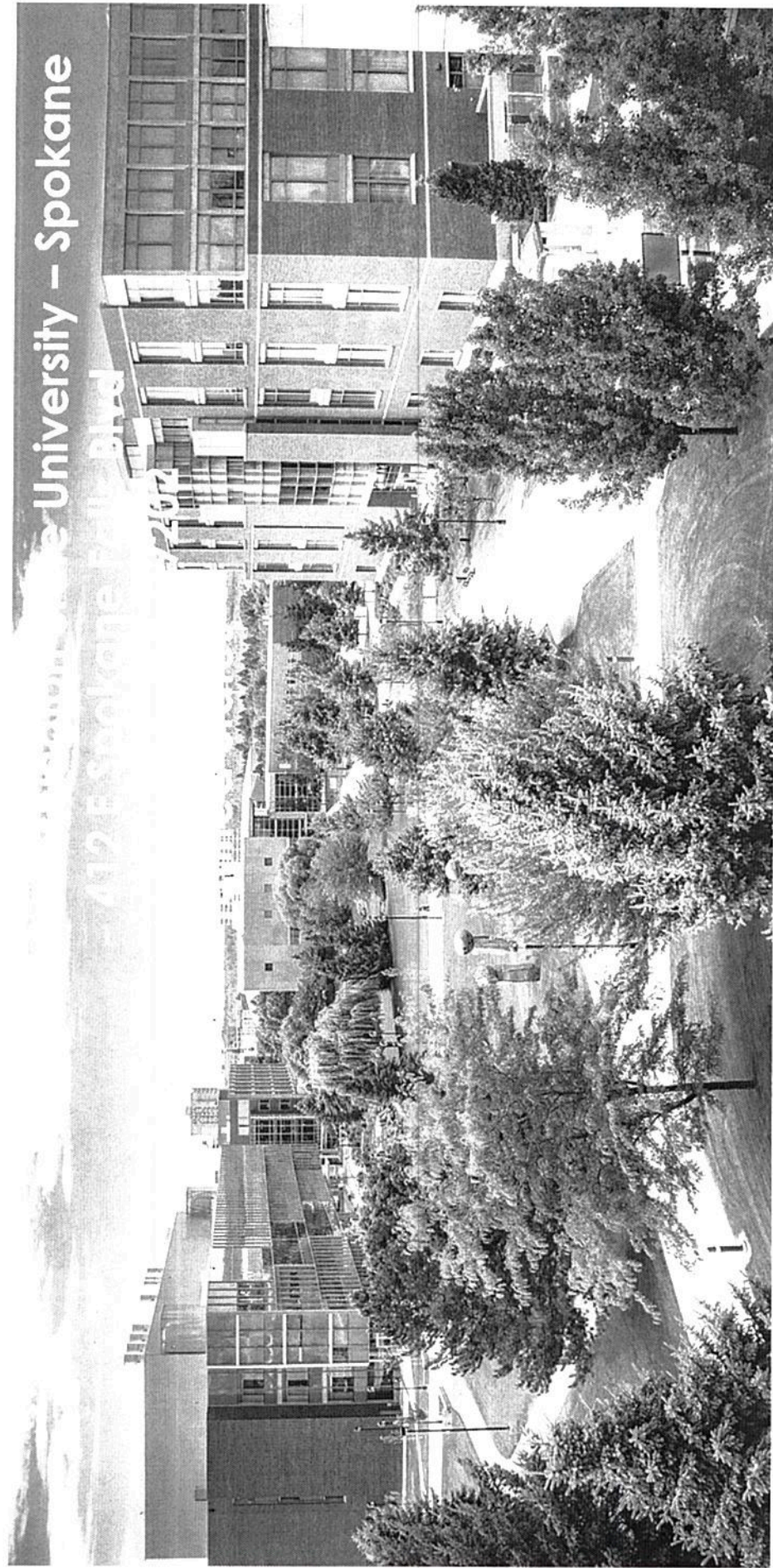
Name: Lt Col Stephanie Rowan  
Chief Nurse, 149<sup>th</sup> MDG

Email: [rowan@eths.wa.edu](mailto:rowan@eths.wa.edu)

Name: Dr. Denise Smart PI  
Email: [dsmart@eths.wa.edu](mailto:dsmart@eths.wa.edu)







University of Idaho – Spokane  
412 E. Spokane Falls Blvd